Identification of Emissions Sources for Pinal County

Technical Advisory Meeting
June 21, 2005

DKS *Associates*

TRANSPORTATION SOLUTIONS

Agenda

1. Introductions
2. Discussion of Revised Work Scope and Schedule
3. Progress on Tasks
4. Review of Scope and Schedule for Remaining Work
5. Next Steps

Discussion of Revised Scope and Schedule

1. Discussion in Sept. '04 TAC meeting reflected a shift in direction on PM_{10} analysis
2. Schedule was extended to allow for revised scope
3. Budget was increased to reflect increased effort for PM_{10} analysis

Examine Ozone as a Regional Issue Correlated with Growth

- Shift away from identification of sources for elevated monitor readings

- Produce estimates of county-wide estimates of emissions of ozone precursors

- Examine the implications of alternative assumptions about growth and travel characteristics

Shift in Direction on the PM$_{10}$ Analysis

- Shift away from identification of sources for elevated monitor readings

- Focus on dirt roads as a source

- Develop a tool for predicting concentration based on roadway volume and soil characteristics

- Include the development of a "Blueprint" for the development of a PM$_{10}$ Attainment Plan

Progress on Tasks

Task 1 – Define Geographical Scope and Analysis Framework

Task 2- Assemble and Collect Data

Task 3 Prepare and Analyze Emissions Estimates

Task 4 Prepare Project Reports

Task 5 Prepare PM_{10} Attainment Plan Blueprint

Task 1 – Define Geographical Scope and Analysis Framework

◆ Completed with the revised scope, schedule and budget

▶ Geographic Coverage – County-wide but case-study areas for PM_{10}

▶ Analysis Timeframe – Current and 2025

▶ Schedule – Extend 6 months to February '06

▶ Budget – Increased by $40,000 for PM_{10} Attainment Plan Blueprint

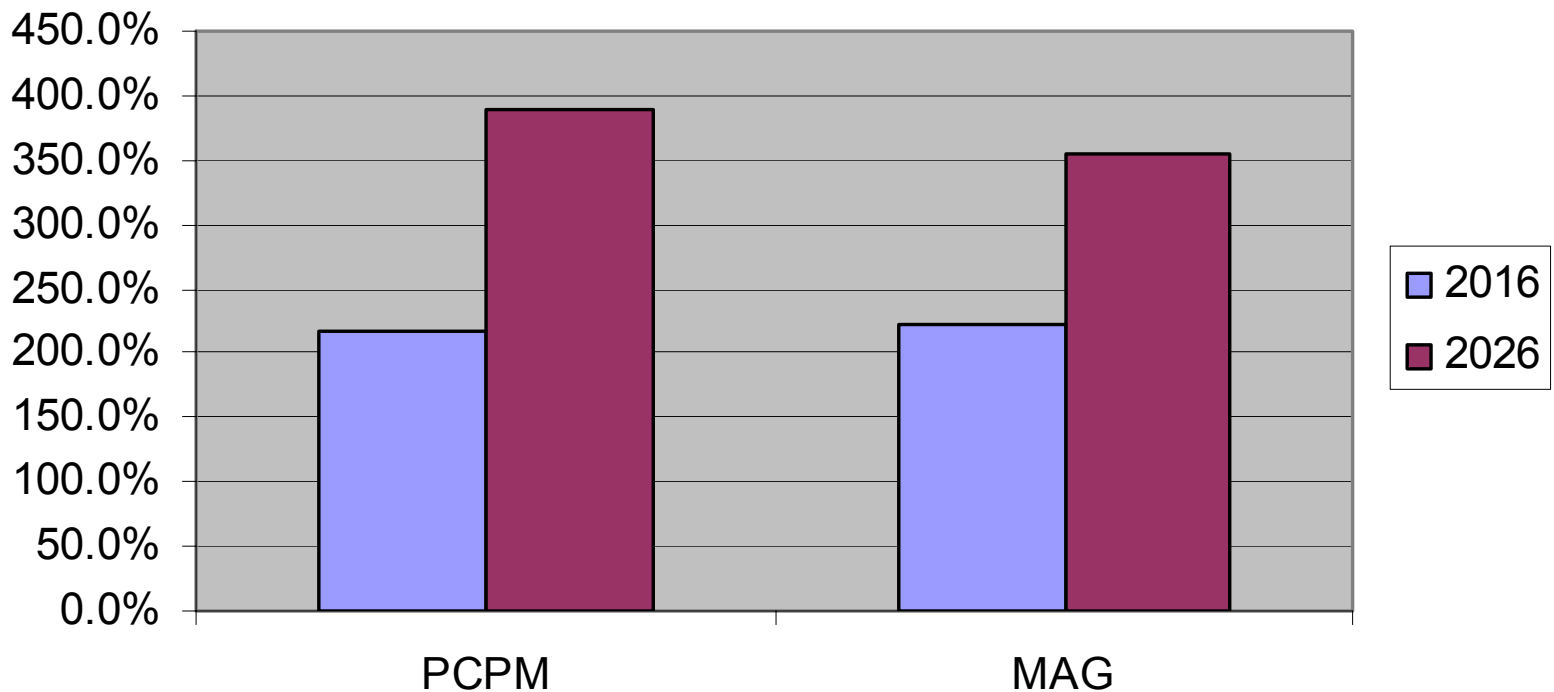# Task 2- Assemble and Collect Data: Ozone Analysis

Completed

- Roadway inventory assembled in GIS database

- Historical and recent traffic counts assembled in GIS database

- MOBILE6 input parameters obtained from MAG

- Forecasts of growth in population, employment and travel were obtained from MAG and from ADOT's Pinal Corridors Planning Model (PCPM)
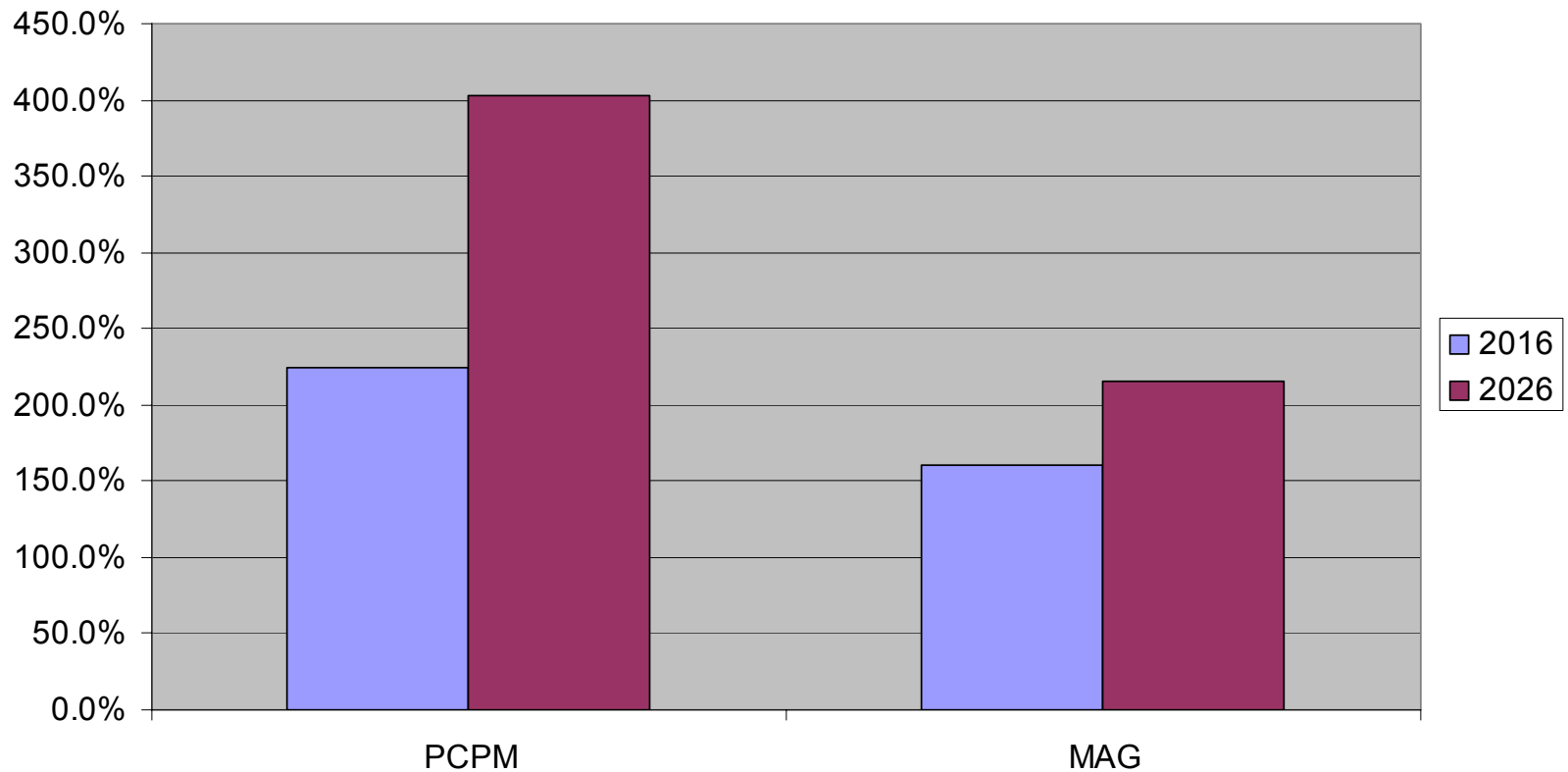
Networks, Counts and Forecasts in GIS Format
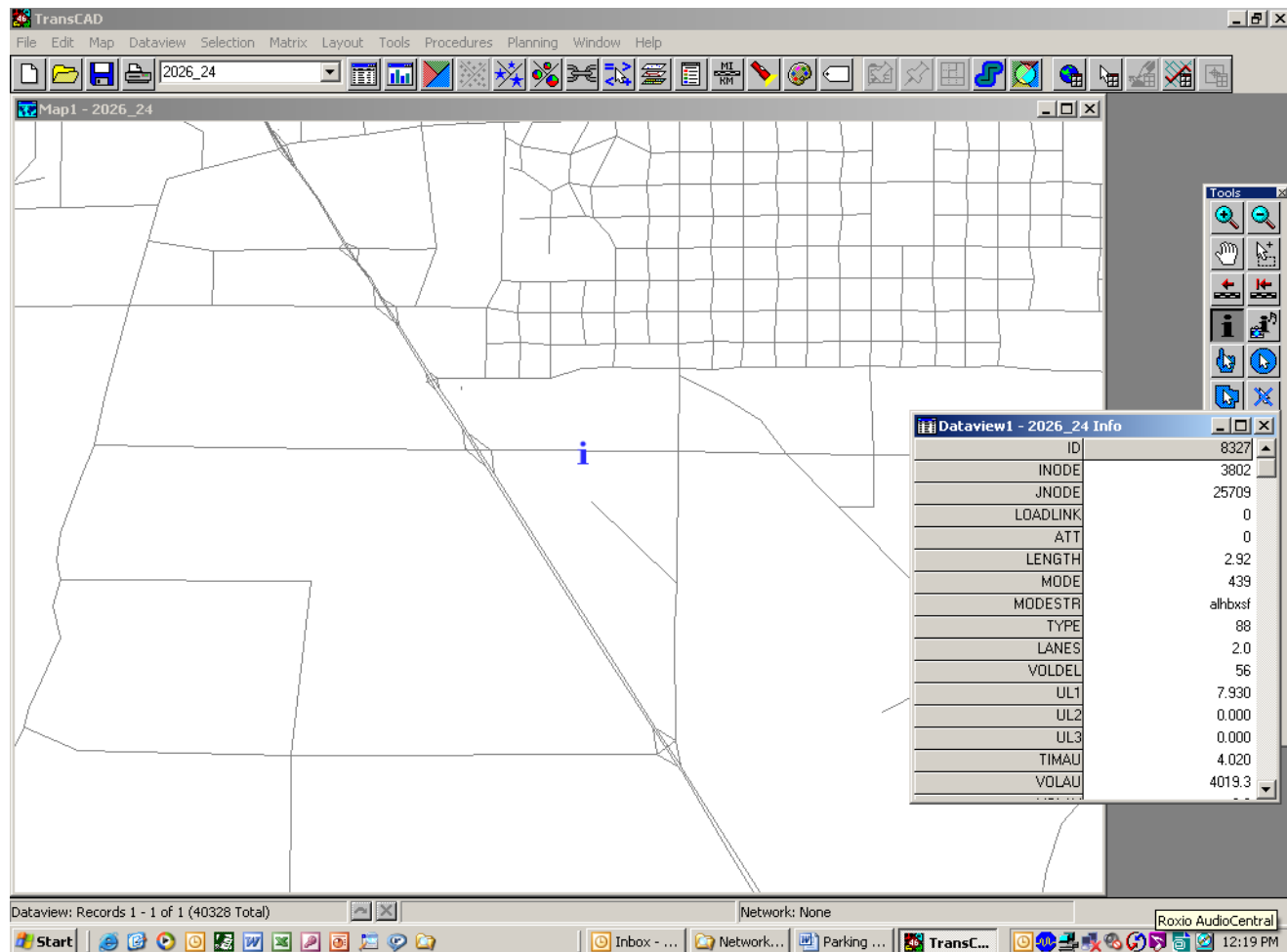
Projected Growth in Pinal County Population

Projected Growth in Pinal County Employment

Task 2- Assemble and Collect Data: PM$_{10}$ Analysis

Completed

- Monitored traffic volumes, speed and vehicle sizes on five unpaved road segments

- Collected unpaved road surface soil samples at same locations

- Received and reformatted meteorological data for dispersion modeling purposes

Task 2- Assemble and Collect Data: PM$_{10}$ Analysis

Remaining

◆ Complete laboratory analysis of unpaved road soil silt and moisture content

Task 3 Prepare and Analyze Emissions Estimates: Ozone Analysis

Completed

- ◆ Obtained emission estimates for 2006, 2016 and 2026 from MAG conformity analysis

Remaining

- ◆ Reconcile population and employment forecasts

- ◆ Use forecasts to estimate future travel

- ◆ Estimate emissions of ROG and NO_X

- ◆ Analyze possible implications of growth for ozone concentrations

Task 3 Prepare and Analyze Emissions Estimates: PM$_{10}$ Analysis

Completed

- Unpaved road emissions equations set up to receive silt content, moisture content and speed data

- Dispersion model set up with local meteorological data to receive emissions data

EPA Emission Equation for Unpaved Road Use

$$E = \frac{k\,(s/12)^a\,(S/30)^b}{(M/0.5)^c} - C$$

where: E = size-specific emission factor (lb/VMT)

s = surface material silt content (%)
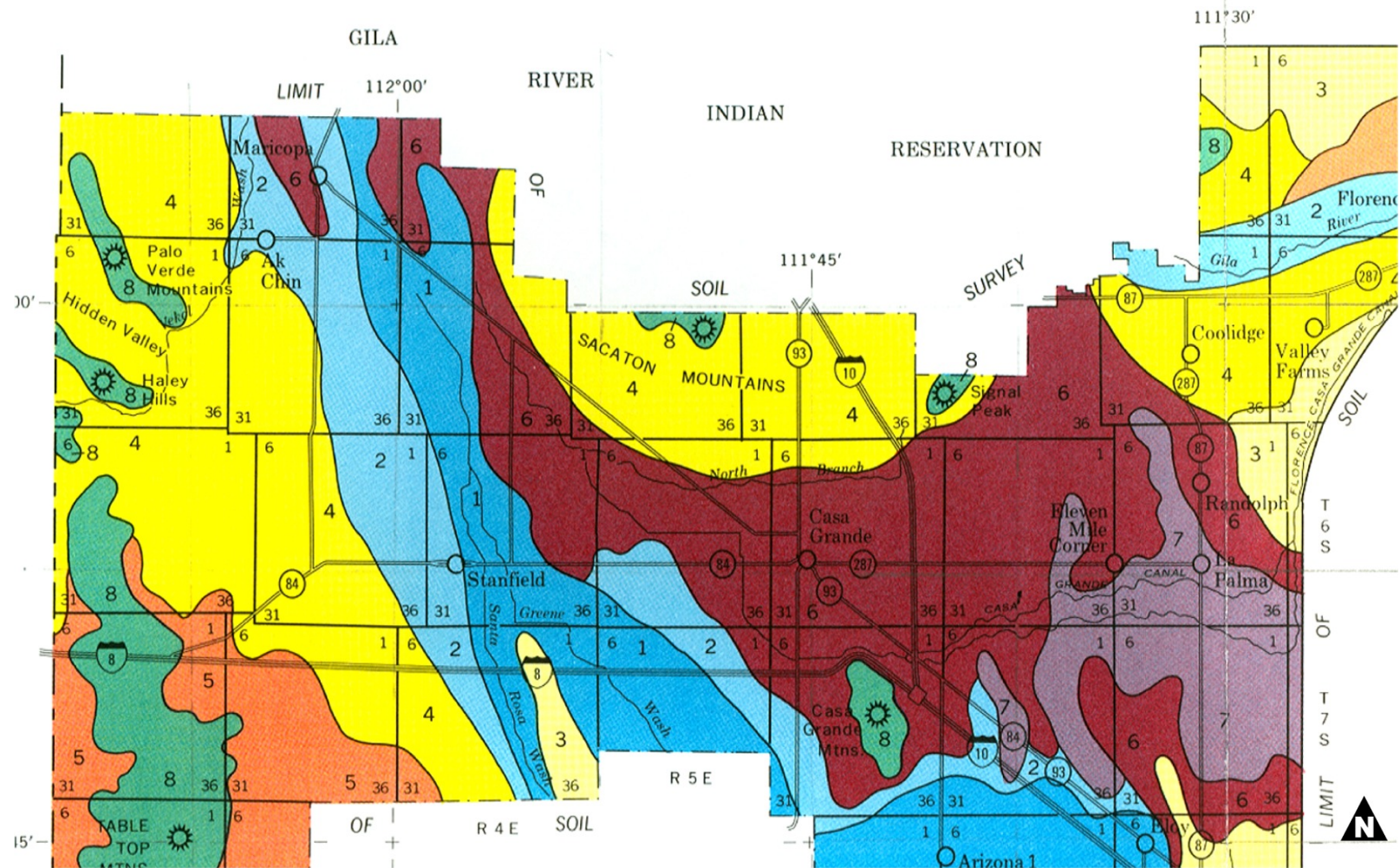
S = mean vehicle speed (mph)

M = surface material moisture content (%)

C = emission factor for 1980's vehicle fleet exhaust, brake wear and tire wear
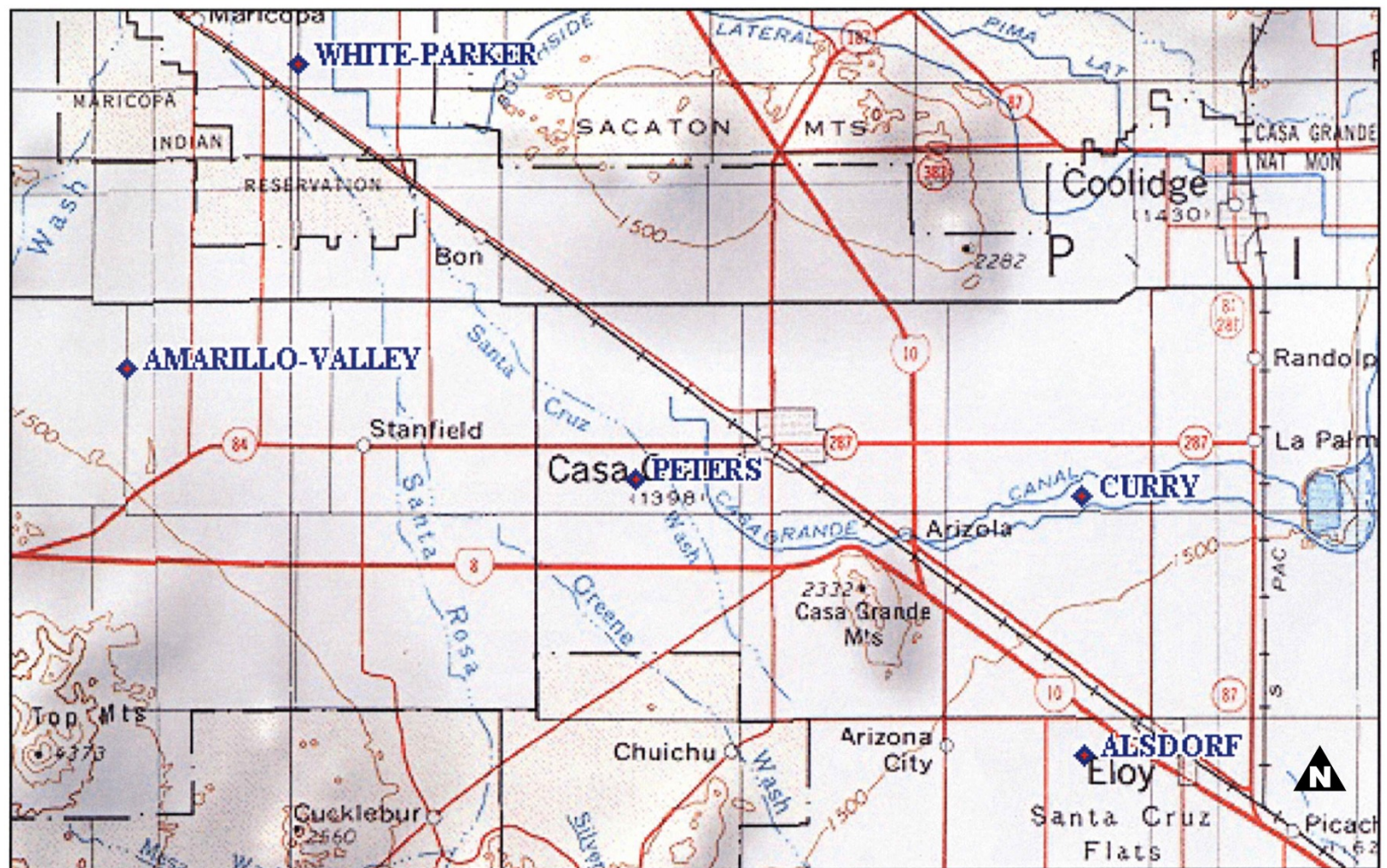
= 0.00047 lb/VMT for PM_{10}

General Soil Map of Western Pinal County

Location of Unpaved Road Traffic Counters

Task 3 Prepare and Analyze Emissions Estimates: PM_{10} Analysis

Remaining

◆ Complete unpaved road emissions analysis

◆ Complete dispersion modeling of unpaved road emissions

◆ Complete spreadsheet tool for analyzing unpaved road air quality impact

◆ Complete analysis of control efficiency and cost effectiveness of unpaved road control measures

Task 4 Prepare Project Reports: Ozone and PM$_{10}$ Analyses

Completed

◆ Progress reports

Remaining

◆ Prepare user's manual for unpaved road spreadsheet tool

◆ Prepare task reports for Tasks 1 – 3

◆ Prepare Final Report

Task 5 Prepare PM$_{10}$ Attainment Plan Blueprint

Completed

- Initial analysis of Pinal County PM$_{10}$ monitoring data

- Serious PM$_{10}$ non-attainment areas with problems similar to Pinal County were identified

- Attainment plans of three areas were reviewed to determine future air quality forecasting techniques

- An initial literature search of air quality planning in development was conducted

Task 5 Prepare PM10 Attainment Plan Blueprint

Remaining

- Complete final analysis of Pinal County PM_{10} air quality data

- Complete review of PM_{10} forecasting models used in other serious non-attainment areas

- Complete evaluation of forecasting models under development

Review of Scope and Schedule for Remaining Work

1. Emissions Estimates for Ozone Analysis
2. Unpaved Road Model Tool
3. PM_{10} Attainment Plan Blueprint

Emissions Estimates for Ozone Analysis

3rd Quarter 2005

- ◆ Examine differences in population and employment forecasts

- ◆ Produce travel estimates for a range of forecasts

- ◆ Produce emissions estimates for each set of travel forecasts

- ◆ Assess possible implications for ozone concentrations

- ◆ Prepare task report

Unpaved Road Model Tool

3rd Quarter 2005

- Complete unpaved road soil sample silt and moisture content analysis

- Complete unpaved road emissions analysis

- Complete dispersion modeling analysis of unpaved road emissions

- Complete draft unpaved road spreadsheet modeling tool

- Complete draft model user's manual

PM10 Attainment Plan Blueprint

3rd Quarter of 2005

◆ Complete analysis of Pinal County PM10 data

◆ Complete review of PM10 forecasting models in other serious non-attainment areas

4th Quarter of 2005

◆ Complete draft of Blueprint report

◆ Complete draft of Final Report

Next Steps

- Proceed with work in all tasks
- TAC meet again in October to review results of Tasks 1 - 4 and progress on Task 5